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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)
	)
Request by WavePhore, Inc. for	)
a Clarification of the Television	)
Rules To Allow Digital Data	)
Transmission within the Video	)
Portion of Television Transmissions.	)

95-42

To: The Commission

COMMENTS OF RADIO TELECOM & TECHNOLOGY INC.

1. Radio Telecom & Technology Inc. (RTT) herein submits these comments in response to the Commission's Public Notice[1/] inviting comments on a request by WavePhore, Inc. (WavePhore) for a clarification of the Commission's rules regarding the transmission of digital data signals within the visual pass-band of television station transmissions. RTT supports WavePhore's request but urges that the Commission should issue a generic ruling and that it is inappropriate to issue a ruling limited to WavePhore's specific technology.

2. RTT has devoted the last ten years to the development of methods for superimposing information on television signals in a manner which is compatible and non-interfering. The United States and other countries have awarded patents to RTT covering a generic area called "synergistic modulation," which patents directly bear on the subject raised by WavePhore and which are a key subset of RTT's patented "T-NET" wireless data transmission system.

1/ DA 94-67, released January 25, 1994.

3. RTT supports the concept behind WavePhore's request; but RTT or anyone else who wishes to superimpose signals on an existing television transmission should be permitted to do so without prior Commission authorization, as long as the signals do not degrade television broadcast reception in any discernible way. WavePhore notes that it is not the first party to propose imbedding data in an NTSC television signal and cites an essentially similar request by NBC, which was approved by the Commission because there would be no discernible degradation of the TV broadcast signal.[2/] Superimposing a low amplitude non-discernible signal on an existing television signal during the video portion must be viewed by the Commission in a similar light for any technology regardless of the specific method employed, whether it be NBC's technology, WavePhore's or RTT's.

4. Accordingly, RTT urges the Commission to approve any new method or application to enable broadcasters and the public to benefit from the fruits of new communications technologies, all of which will become part of the so-called "information superhighway." Unless technologies such as these are allowed to come into being without undue regulatory restraints, TV broadcasters will not be able to compete effectively in the future multimedia and interactive television world.

5. There is at least one major question which the Commission must address in evaluating WavePhore's specific technology that is not a question with either the NBC or RTT

2/ Letter from Roy J. Stewart to NBC, dated March 3, 1992.

technologies: What is the impact of WavePhore's proposal to insert its new data signal within the NTSC signal in the range between 3.9 MHz and 4.2 MHz? RTT assumes that this band is expressed in relation to the carrier frequency of the NTSC television signal, so that WavePhore's signal lies between the chroma subcarrier and the audio carrier. The bottom paragraph of page 2 of WavePhore's request indicates that "the encoder performs two functions: a slight low pass filtering and delay equalization of the video signal and linear addition of the data to the video." This function raises the question of whether it is permissible to filter out some of the video signal in order to insert the desired new data signal.

6. Considering this question in more detail, Figure 5 of Section 73.699 of the Commission's Regulations shows clearly that the bandpass characteristic of the transmitted video signal channel is expected to begin to roll off at frequencies above 4.2 MHz, reaching a negligible value just below the sound carrier centered at 4.5 MHz. Figure 11 illustrates the assumed TV receiver detector output and indicates that the ideal receiver detector output rolls off at frequencies above 4.2 MHz. WavePhore apparently wishes to roll-off the video 0.3 MHz lower, at approximately 3.9 MHz, where its signal begins. This roll-off could not only adversely affect the monochrome fidelity but could also make the chroma subcarrier sidebands become even more asymmetric.

7. Consequently, a question arises as to whether or not a broadcaster may reshape the output of its transmitted video signal so as to delete any video that might otherwise interfere with the proposed new inserted data. RTT's design philosophy has always assumed that existing video bandpass characteristics described in the Commission's Rules are not to be altered. RTT has experimented with modulation mechanisms, both at baseband and subcarrier, so as to position new data signal energy in various portions of the assigned TV channel, including areas between the chroma subcarrier and the sound subcarrier. If the Commission permits alteration (e.g., notching or faster roll-off) of the video bandpass characteristics, then RTT will rethink placing its data signal between the chroma subcarrier and the audio carrier, or indeed at any other place where a "notch" would not "cause discernible degradation of the video signal." Any of these options is covered under RTT's patents.

8. On the other hand, if the Commission takes the position that the video bandpass characteristics as set forth in Section 73.699 must not be altered, that would set a different standard for designers. RTT requests that the Commission clarify this broader point when it rules on WavePhore's request.

9. The Commission must base its decision not only on the basis of the WavePhore's request but also within the context of the numerous multimedia technologies and applications of which Wavephore's proposal is only a part. If broadcasters are given the flexibility to use their signal in a variety of ways, as long

as there are no discernible effects on NTSC transmissions to television receivers or on adjacent channels, and the public is the beneficiary, then the Commission should not be concerned with the details of implementation.

10. It is clear to technical experts that the NTSC standard that has served many nations well for several decades is no longer an efficient format by itself in today's world of highly advanced electronic technology. Nevertheless, NTSC is and will continue to be a good workhorse that can carry considerably more information in a synergistic manner than anyone has heretofore imagined. The NBC application approved by the Commission and the proposed WavePhore and RTT technologies as well are merely a first opening of the door to the many potential applications that can effectively share today's 6 MHz NTSC channel.

11. A particularly exciting example of a new application of television technology is the future use of "reverse VBI" to transmit TV viewer replies back to the broadcast studio. RTT has demonstrated that broadcasters can use their existing 6 MHz bandwidth not only to send data outbound to viewers superimposed on television video but also to receive inbound viewer responses during NTSC blanking intervals. This technology is described and discussed in U.S. patent numbers 4,750,036 and 5,177,604 granted to RTT.

12. The Commission must look beyond WavePhore's request to a time when broadcasters will be given greater flexibility to use

their spectrum in such applications as two-way television.[3/] Such flexibility could immediately launch broadcasters into the interactive TV world in a very competitive position, without requiring additional spectrum. Viewers could quickly and easily respond with their remote control keypads to surveys, home shopping, educational programs and the like. This kind of activity would fit within the concept of mass media "broadcasting" in the traditional sense of the term.[4/]

13. RTT holds an experimental license to investigate and demonstrate two-way television technology on a co-channel basis, in cooperation with an existing television broadcast station serving the New York City market. RTT looks forward to submitting the results of its experiment to the Commission along with the "second half" of the instant proceeding, requesting approval for co-channel viewer responses in a manner similar to IVDS.

3/ To guard against even the potential for interference to conventional television reception, initial technical standards for co-channel viewer response signals could be based on the same concepts the Commission developed for IVDS (Interactive Television and Data Service), for example, the five-second-per-hour duty cycle for each subscriber unit.

4/ Data transmission of the nature discussed in these comments does not raise the issue currently being debated in Congress over whether broadcasters should be permitted to use new spectrum for any purpose they like without paying for it. That debate relates principally to new spectrum to be allotted to broadcasters for ATV. The type of data transmission proposed by WavePhore, NBC, and RTT relates to NTSC television and is no different in basic concept from VBI and subcarrier data transmissions that have been permitted by the Commission for many years at the discretion of broadcast licensees.

14. Decisions relating to the future of NTSC television and associated synergistic technology must be made and implemented notwithstanding the advent of Advanced Television Systems (ATV). While WavePhore's request does not directly raise the ATV issue, the question of the phasing out of NTSC in favor of ATV cannot help but come to mind. If technologies such as proposed by WavePhore and RTT find strong market appeal, then NTSC may be phased out more slowly than many have predicted. With some 300 million NTSC television receivers operating today in the United States, NTSC technology may continue to benefit the public in new ways far longer than the Commission has previously anticipated. Therefore RTT urges the Commission not to delay approval of the instant petition because of fear that NTSC may "compete" with ATV or become entrenched longer than anticipated. If NTSC is a service the market demands, improvements must not be stifled,[5/] and the system must be allowed to operate, until the market decisively moves in favor of a replacement.

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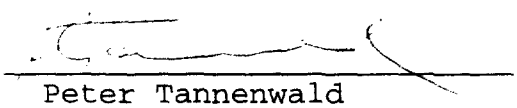
Respectfully submitted,



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March 14, 1994

5/ Indeed, the emerging data transmission capacity of the NTSC system is as much a "new technology" as ATV and is entitled to the same encouragement under Section 7 of the Communications Act.

CERTIFICATE OF SERVICE

I, Lucy S. Colebaugh, do hereby certify that on this 14th day of March, 1994, I have caused to be sent by first class United States mail, postage prepaid, copies of foregoing "Comments of Radio Telecom and Technology, Inc." to the following:

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